

What is claimed is:

1. A resin composition comprising:

a polyethylene resin (A) in an amount of 100 parts by weight; and

5 a long-chain branched ethylene/ α -olefin random copolymer (B) comprising ethylene and an α -olefin having 3 to 20 carbon atoms in an amount of 0.5 to 5000 parts by weight,

wherein the polyethylene resin (A) has:

10 (a) a melt flow rate (MFR, ASTM D 1238, 190°C, a load of 2.16kg) of 0.01 to 150 g/10 min; and

(b) a density of 0.901 to 0.970 g/cm³, and

wherein the ethylene/ α -olefin random copolymer (B) has:

15 (a) a density of not more than 0.900 g/cm³;

(b) an intrinsic viscosity (η), as measured in decalin at 135°C, of 0.3 to 3.0 dl/g;

(c) a glass transition temperature (T_g) of not more than -50°C;

20 (d) a crystallinity, as measured by X-ray diffractometry, of less than 40%;

(e) a molecular weight distribution (M_w/M_n), as measured by GPC, of not more than 3.0;

(f) a B value, as determined by ¹³C-NMR spectrum and the
25 following equation, of 1.0 to 1.4; and

(g) a ratio $g\eta^*$ of the intrinsic viscosity (η) determined in the property (b) to the intrinsic viscosity (η)_{blank} of a linear ethylene-propylene copolymer having the same weight-

average molecular weight (measured by a light scattering method) as the copolymer rubber (B) and having an ethylene content of 70 % by mol, $(\eta)/(\eta)_{\text{blank}}$, of 0.2 to 0.95,

$$B \text{ value} = (P_{OE}) / (2 \cdot (P_E) \cdot (P_O))$$

- 5 wherein (P_E) and (P_O) are respectively a molar fraction of the units derived from ethylene and a molar fraction of the units derived from the α -olefin in the copolymer rubber (B), and (P_{OE}) is a proportion of the number of the α -olefin/ethylene sequences to the number of all the dyad
10 sequences.

2. A soft resin composition comprising:

a polyethylene resin (A-X) in an amount of 100 parts by weight; and

- 15 a long-chain branched ethylene/ α -olefin random copolymer (B-Y) comprising ethylene and an α -olefin having 3 to 20 carbon atoms in an amount of 50 to 5000 parts by weight,

wherein the polyethylene resin (A-X) has:

- 20 (a) a melt flow rate (MFR, ASTM D 1238, 190°C, a load of 2.16kg) of 3 to 150 g/10 min; and

(b) a density of 0.901 to 0.970 g/cm³, and

wherein the ethylene/ α -olefin random copolymer (B-Y) has:

- 25 (a) a density of not more than 0.900 g/cm³;
(b) an intrinsic viscosity (η) , as measured in decalin at 135°C, of 0.3 to 3.0 dl/g;

- (c) a glass transition temperature (T_g) of not more than -50°C ;
- (d) a crystallinity, as measured by X-ray diffractometry, of less than 40%;
- 5 (e) a molecular weight distribution (M_w/M_n), as measured by GPC, of not more than 3.0;
- (f) a B value, as determined by ^{13}C -NMR spectrum and the above equation, of 1.0 to 1.4; and
- (g) a ratio $g\eta^*$ of the intrinsic viscosity (η) of said
- 10 copolymer rubber (B) determined in the property (b) to the intrinsic viscosity $(\eta)_{\text{blank}}$ of a linear ethylene-propylene copolymer having the same weight-average molecular weight (measured by a light scattering method) as the copolymer rubber (B) and having an ethylene content of 70 % by mol,
- 15 $(\eta)/(\eta)_{\text{blank}}$, of 0.2 to 0.95.

3. An ethylene/ α -olefin copolymer resin composition comprising:

- a polyethylene resin (A- α) in an amount of 100 parts
- 20 by weight; and

- a long-chain branched ethylene/ α -olefin random copolymer (B- α) in an amount of 5 to 67 parts by weight,

- wherein the polyethylene resin (A- α) is a linear ethylene/ α -olefin copolymer (A-0) comprising ethylene and
- 25 α -olefin having 4 to 20 carbon atoms and has:

- (a) a density of 0.901 to 0.940 g/cm^3 ; and
- (b) a melt flow rate (MFR) of 0.01 to 20 $\text{g}/10$ min, and

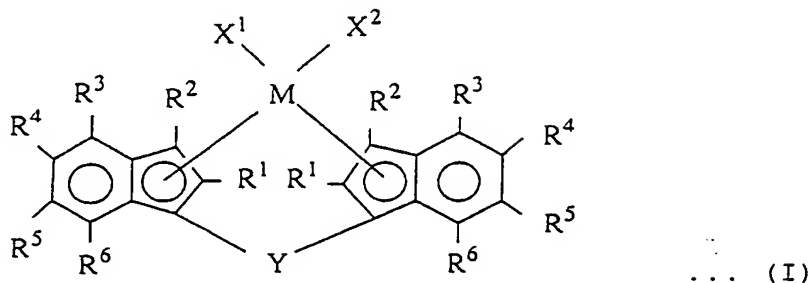
wherein the long-chain branched ethylene/ α -olefin random copolymer (B- α) has:

- (a) a density of 0.860 to 0.900 g/cm³;
- (b) a melt flow rate (MFR) of 0.01 to 20 g/10 min;
- 5 (c) an intrinsic viscosity (η), as measured in decalin at 135°C, of 0.3 to 3.0 dl/g;
- (d) a glass transition temperature (T_g) of not more than -50°C;
- (e) a crystallinity, as measured by X-ray diffractometry,
- 10 of less than 40%;
- (f) a molecular weight distribution (M_w/M_n), as measured by GPC, of not more than 3.0;
- (g) a B value, as determined by ¹³C-NMR spectrum and the above equation, of 1.0 to 1.4; and
- 15 (h) a ratio $g\eta^*$ of the intrinsic viscosity (η) determined in the property (c) to the intrinsic viscosity (η)_{blank} of a linear ethylene-propylene copolymer having the same weight-average molecular weight (measured by a light scattering method) as the copolymer rubber (B) and having an ethylene
- 20 content of 70 % by mol, $(\eta)/(\eta)_{\text{blank}}$, of 0.2 to 0.95.

4. The resin composition as claimed in any one of claims 1 to 3, wherein the ethylene/ α -olefin random copolymer is a ethylene/ α -olefin random copolymer prepared

25 by randomly copolymerizing ethylene and an α -olefin having 3 to 20 carbon atoms in the presence of a metallocene

catalyst comprising a metallocene compound represented by the following formula (I):



5 wherein M is a transition meta of Group IVB of the periodic table,

R^1 is a hydrocarbon group having 1 to 6 carbon atoms;

R^2 , R^4 , R^5 and R^6 may be identical with or different from each other and are each hydrogen or a halogen atom, or
10 a hydrocarbon group of 1 to 6 carbon atoms,

R^3 is an aryl group of 6 to 16 carbon atoms which may be substituted with a halogen atom, a hydrocarbon group of 1 to 20 carbon atoms or an organic silyl group,

X^1 and X^2 are each independently hydrogen or a halogen
15 atom, or a hydrocarbon group of 1 to 20 carbon atoms, a halogenated hydrocarbon group of 1 to 20 carbon atoms, an oxygen-containing group or a sulfur-containing group, and

Y is a divalent hydrocarbon group of 1 to 20 carbon atoms, a divalent halogenated hydrocarbon group of 1 to 20
20 carbon atoms, a divalent silicon-containing group, a divalent germanium-containing group, a divalent tin-containing group, -O-, -CO-, -S-, -SO-, -SO₂-, -NR⁷-, -P(R⁷)-, -P(O)(R⁷)-, -BR⁷- or -AlR⁷- (in the formulae, the R^7 is hydrogen or a halogen atom, or a hydrocarbon group of

1 to 20 carbon atoms or a halogenated hydrocarbon group of
1 to 20 carbon atoms).

5. A film made from the resin composition as claimed
5 in claim 3 or 4.

6. The film as claimed in claim 5, which is produced
by inflation molding.